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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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SCHWABE, WILLIAMSON & WYATT
PACWEST CENTER, SUITE 1900
1211 S.W. FIFTH AVE.
PORTLAND, OR 97204

EXAMINER

HOFFBERG, ROBERT JOSEPH

ART UNIT	PAPER NUMBER
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2835

DATE MAILED: 08/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/748,309	Applicant(s) WEI, WEN	
	Examiner Robert J. Hoffberg	Art Unit 2835	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-10,12-15,17-24 and 26-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-10,12-15,17-24 and 26-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/19/05 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

Response to Arguments

1. Applicant's arguments with respect to claims 1, 3-10, 12-15, 17-24 and 26-34 have been considered but are moot in view of the new ground(s) of rejection.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the first and second sides and the first second supports must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

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the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3, 6, 8-10, 12-15, 17, 20, 22-30 and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perazzo (US 6,813,152) in view of Chen et al. (US 6,592,327).

With respect to Claim 1, Perazzo teaches a modular platform cooling apparatus, comprising: at least one plenum (Fig. 7, #42) associated with the apparatus; and a first and a second fan module (Fig. 7, #10 left and center) arranged in a side by side relationship, configured to removably (Col. 2, line 44) and independently (Col. 2, line 53) engage the plenum, each having first and second spaced apart side panels (Fig. 3, #12 near and far walls), and each being designed to direct an airflow through a bottom (Fig. 7, #20) of the first and second fan modules and out a respective rear portion (Fig. 6, #24, side) of the first and second fan modules. With respect to Claim 6 and 20, Perazzo further teaches that at least one of the first and second fan modules may be removed from at least one plenum while the other fan module continues to provide airflow (Col. 2, line 53) through a modular platform (Col. 1, lines 17-20). Perazzo fails to teach a fan

module with a plurality of fans arranged in a matrix array of $2 \times N$ fans and a first and second support members. Chen et al. teach a fan module (see Fig. 3) with a plurality of fans (#204) arranged in a matrix array of $2 \times N$ fans (see Fig. 3) positioned in a N-across by N-deep in-plane relationship wherein N fans are positioned substantially behind N other of the $2 \times N$ fans, where N is an integer equal to or greater than 2; first (Fig. 3, #202 front) and second (Fig. 3, #202 rear) support members each coupled at opposite ends thereof to the respective first (Fig. 3, #202 left side) and second (Fig. 3, #202 right side) side panels wherein the first support member is adapted to support (see Fig. 3) the N fans positioned substantially behind the N other of the $2 \times N$ fans, and the second support member is adapted to support (see Fig. 3) the other of the $2 \times N$ fans.

With respect to Claim 15, Perazzo teaches a modular platform, comprising: a plurality of modular platform boards (Col. 1, line 27); at least one plenum (Fig. 7, #42) coupled to the modular platform (Fig. 7, #40); and a first and a second fan module (Fig. 7, #10 left and right side) arranged in a side by side relationship, configured to removably (Col. 2, line 44) and independently (Col. 2, line 53) engage the plenum, each having first and second spaced apart side panels (Fig. 3, #12 near and far walls), and each being designed to direct an airflow through a bottom (Fig. 7, #20) of the first and second fan modules and out a respective rear portion (Fig. 6, #24, side) of the first and second fan modules. With respect to Claim 29, Perazzo further teaches wherein the modular platform includes an intake plenum (Fig. 7, #44) and an exhaust (Fig. 7, #42) plenum. With respect to Claim 30, Perazzo further teaches wherein the first and second fan modules are positioned in the exhaust plenum (see Fig. 7). Perazzo fails to teach a

fan module with a plurality of fans arranged in a matrix array of $2 \times N$ fans. Chen et al. teach a fan module (see Fig. 3) with a plurality of fans (#204) arranged in a matrix array of $2 \times N$ fans (see Fig. 3) positioned in a N-across by N-deep in-plane relationship wherein N fans are positioned substantially behind N other of the $2 \times N$ fans, where N is an integer equal to or greater than 2; first (Fig. 3, #202 front) and second (Fig. 3, #202 rear) support members each coupled at opposite ends thereof to the respective first (Fig. 3, #202 left side) and second (Fig. 3, #202 right side) side panels wherein the first support member is adapted to support (see Fig. 3) the N fans positioned substantially behind the N other of the $2 \times N$ fans, and the second support member is adapted to support (see Fig. 3) the other of the $2 \times N$ fans.

With respect to Claims 3 and 17, Perazzo teaches the claimed invention except for that the fans are arranged 2-across by 2-deep in-plane relationship. Chen et al. further teaches that at least one of the first and second fan modules includes a matrix array of four fans (see Fig. 3) wherein $N=2$.

With respect to Claims 4 and 18, Perazzo teaches the claimed invention except for the six-fan matrix arrangement in the fan module. Chen et al. further teach teaches that a fan module can be arranged in a 3-across by 2-deep (see Fig. 3) in-plane relationship.

With respect to Claims 7 and 21, Perazzo in view of the claimed invention except for the circuitry designed to allow for hot-swapping the second fan module while the apparatus is in operation. Chen et al. teach the circuitry (Col. 1, line 20) designed to

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allow the second fan module to be removably (Col. 1, line 6) added to the apparatus while the apparatus, including the first fan module, is in operation.

With respect to Claims 8 and 22, Perazzo in view of Chen et al. teach the claimed invention except for the specific airflow capacity of each fan module. Perazzo further discloses that an airflow that is produced by a given fan model (Col. 6, line 18). It would have been obvious to one of ordinary skill in the art at the time of the invention was made that the number of fans selected to be incorporated into a fan module is proportionate (the first fan module would be selected to provide sufficient airflow capacity to cool $(y/x)m$ modular platform boards at a specified capacity, where y equals the total number of side-by-side fans in the first fan module and x equals the total number of fans positioned side by side across an aggregate width of the modular platform, and m equals the total number of modular platform boards to the fan module's width compared to the total width of modular platform, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With respect to Claims 9 and 23, Perazzo in view of Chen et al. teach the claimed invention except for that the specific remaining airflow when a fan module is removed. Perazzo discloses an airflow through each fan housing (Col. 5, line 58). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include a capacity greater than 50% or any percentage that the first fan module will continue to provide airflow through the modular platform to support the modular platform boards and a capacity greater than 50% when the second fan module

has been removed from the plenum, which would allow the device to operate at maximum efficiency, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With respect to Claims 10 and 24, Perazzo in view of Chen et al. teach the claimed invention including that the fan modules are capable of providing sufficient airflow, when operating in conjunction with each other (Perazzo, Col. 6, lines 14+). They fail to disclose the specific airflow of the fan modules. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include a combined cooling capacity of 2 m (where m equals the total number of modular platform boards) or any other capacity to insure that a single fan module alone has the capacity to cool the m modular platform boards, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With respect to Claims 12 and 26 Perazzo in view of Chen et al. teach the claimed invention including that the plenum is the width of the apparatus and the combined width fan modules are the width of the apparatus in Perazzo, Fig. 7. They fail to teach the specific width of the plenum and fan modules. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have the width of the plenum and the combined width of the fan modules to be less than or equal to 440 mm or any other width to cool the modular platform cooling apparatus, since it has been held that discovering an optimum value of a result effective variable

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involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With respect to Claims 13 and 27, Perazzo in view of Chen et al. teach the claimed invention including that the electronics must be cooled to prevent overheating (Perazzo, Col. 1, line 48). They fail to teach the temperature rise or maximum power consumption of the platform. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have a less than or equal to 10-degrees Celsius temperature increase per modular platform board, where each modular platform board can generate up to 200 Watts, or any other maximum temperature increase which permits the electronics to operate properly, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With respect to Claims 14 and 28, Perazzo in view of Chen et al. teach the claimed invention including a modular platform for platform boards (Perazzo, Col. 1, line 26-27). They fail to teach for the number of boards. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have up to sixteen modular platform boards or any number boards and the first fan module and the second fan module or any number of fan modules to provide enough airflow to keep the temperature increase across any modular platform board to less than or equal to 10 degrees Celsius or any temperature increase which permits the electronics to operate properly, since it has been held that discovering an optimum value of a result effective

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variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With respect to Claims 33 and 34, Perazzo in view of Chen et al. teach the claimed invention including that the fan modules may operate with a different number of fans operating (Perazzo, Col. 6, lines 25-32). They fail to teach that the fan modules may include a different number of fans. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have a first fan module that has a first number of fans and the second fan module that has second number of fans, the first number is different from the second number or as many fans in each module as is necessary for the apparatus or platform to properly operate under the normal or expected fault operating conditions, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the modular platform cooling apparatus or modular platform of Perazzo with the hot-swap fan module and of Chen et al. for the purpose of having fans with supporting structure arranged in both a serial and parallel configuration to have maximum draft for cooling the modular platform and to add circuitry to remove a fan module during apparatus operation to minimize down time of the apparatus.

5. Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perazzo (US 6,813,152) in view of Chen et al. (US 6,592,327) as applied to the claim 15 above, and further in view of Negishi (US 6,421,238).

With respect to Claim 31, Perazzo in view of Chen et al. teach the claimed invention except for the dual plenum fan modules. Negishi teaches that the first (Fig. 7, #24 on left side) and second (Fig. 7, #24 on right side) fan modules are configured as dual plenum (Fig. 8, #28) fan modules, having a first portion acting as an intake (upper surface of Fig. 8, #28) for an adjacent modular platform and a second portion acting as an exhaust (lower surface of Fig. 8, #28) for the modular platform.

With respect to Claim 32, Perazzo in view of Chen et al. and further in view of Negishi teach the claimed invention including that an appropriate fan is chosen to fit the space constraints (see Negishi, Fig. 1). They fail to teach the height of the fan modules. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the modular platform for the height of the first and second fan modules to be less than or equal to 2 U or any other height in order to fit into the space provided for ventilation, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the modular platform of Perazzo in view of Chen et al. with that of Negishi to position the plenum wall to create two separate airflow paths to save space, parts and costs.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Thompson et al. (US 6,714,411) teach a hot-swap fan module

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with a support structure having fans arranged in a matrix array of 2xN fans. Doblar et al. (US 6,768,640) teach a hot-swap fan module with a support structure having fans arranged in a matrix array of 2xN fans. Doustou et al. (US 6,392,872), Jensen (US 6,556,440), Huang et al. (US 6,663,416), Jensen et al. (US 6,674,641), Cravens et al. (US 6,839,233) and Rubenstein et al. (US 7,021,895) teach a fan module with a support structure having fans arranged in a matrix array of 2xN fans.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert J. Hoffberg whose telephone number is (571) 272-2761. The examiner can normally be reached on 8:30 AM - 4:30 PM Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn D. Feild can be reached on (571) 272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RJH *2/10/07*

Lynn D. Feild
LYNN FEILD
SUPERVISORY PATENT EXAMINER